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PCT/PTO

THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of: Ferrand et al ✓

Serial No.: 09/582,256 ✓

Filed: June 22, 2000 ✓

For: Passive Q-Switched Microlaser with Controlled Polarisation

Docket: BREV 12923 ✓

2581 ✓  
D. Coe  
11-8-00  
CFR  
#7  
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The Commissioner of Patents & Trademarks  
Washington, D.C. 20231

REQUEST FOR CORRECTION OF FILING RECEIPT

Dear Sir:

We enclose a copy of the filing receipt in which we have marked in red ink the correction for a clerical error contained therein, i.e., total claims should be "16" and independent claims should be "2". Also enclosed is a copy of the transmittal letter together with the Preliminary Amendment as support of the correct information.

We respectfully request that you correct your records and send a corrected filing receipt. We believe there are no fees involved with this correction. However, in the event there are any fees payable, please charge them to our Deposit Account No. 08-1391.

Respectfully submitted,

Norman P. Soloway  
Attorney for Applicant  
Reg. No. 24,315

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, DC 20231 on August 11, 2000 at Manchester, New Hampshire.

By: Kristine Stevens

**FILING RECEIPT**

\*OC00000005282763\*

**UNITED STATES DEPARTMENT OF COMMERCE  
Patent and Trademark Office**Address: ASSISTANT SECRETARY AND  
COMMISSIONER OF PATENT AND TRADEMARKS  
Washington, D.C. 20231

APPLICATION NUMBER	FILING DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	DRAWINGS	TOT CLAIMS	IND CLAIMS
09/582,256	06/22/2000	2881	840	BREV12923	-	16	2

HAYES SOLOWAY HENNESSEY  
GROSSMAN & HAGE  
175 CANAL STREET  
MANCHESTER, NH 03101-2335



Date Mailed: 07/31/2000

Receipt is acknowledged of this nonprovisional Patent Application. It will be considered in its order and you will be notified as to the results of the examination. Be sure to provide the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION when inquiring about this application. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please write to the Office of Initial Patent Examination's Customer Service Center. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the PTO processes the reply to the Notice, the PTO will generate another Filing Receipt incorporating the requested corrections (if appropriate).

**Applicant(s)**

BERNARD FERRAND, VOREPPE, FRANCE;  
BERNARD CHAMBAZ, SEYSSINS, FRANCE;  
LAURENT FULBERT, VOIRON, FRANCE;  
JEAN MARTY, SEYSSINS, FRANCE;

**Continuing Data as Claimed by Applicant**

THIS APPLICATION IS A 371 OF PCT/FR98/02848 12/23/1998

**Foreign Applications**

FRANCE 97 16518 12/24/1997

If Required, Foreign Filing License Granted 07/31/2000

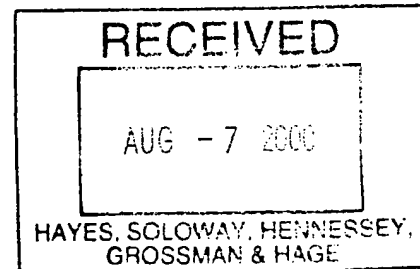
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**Title**

PASSIVE Q-SWITCHED MICROLASER WITH CONTROLLED POLARISATION

**Preliminary Class**

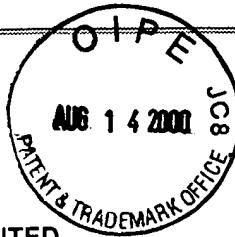
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Data entry by : ORDENEZ, MARTA

Team : OIPE

Date: 07/31/2000



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**LICENSE FOR FOREIGN FILING UNDER**  
**Title 35, United States Code, Section 184**  
**Title 37, Code of Federal Regulations, 5.11 & 5.15**

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The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

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The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Office of Export Administration, Department of Commerce (15 CFR 370.10 (j)); the Office of Foreign Assets Control, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

**NOT GRANTED**

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

**PLEASE NOTE the following information about the Filing Receipt:**

- The articles such as "a," "an" and "the" are not included as the first words in the title of an application. They are considered to be unnecessary to the understanding of the title.
- The words "new," "improved," "improvements in" or "relating to" are not included as first words in the title of an application because a patent application, by nature, is a new idea or improvement.
- The title may be truncated if it consists of more than 600 characters (letters and spaces combined).
- The docket number allows a maximum of 25 characters.
- If your application was submitted under 37 CFR 1.10, your filing date should be the "date in" found on the Express Mail label. If there is a discrepancy, you should submit a request for a corrected Filing Receipt along with a copy of the Express Mail label showing the "date in."

Any corrections that may need to be done to your Filing Receipt should be directed to:

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 Washington, DC 20231

FORM PTO-1390 (Modified)  
(REV 11-98)

U.S. DEPARTMENT

OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTORNEY'S CASE NUMBER

**TRANSMITTAL LETTER TO THE UNITED STATES  
DESIGNATED/ELECTED OFFICE (DO/EO/US)  
CONCERNING A FILING UNDER 35 U.S.C. 371**

BREV 12923

U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR

INTERNATIONAL APPLICATION NO.  
PCT/FR98/02848INTERNATIONAL FILING DATE  
23 December 1998 (23.12.98)PRIORITY DATE CLAIMED  
24 December 1997 (24.12.97)

TITLE OF INVENTION

PASSIVE Q-SWITCHED MICROLASER WITH CONTROLLED POLARISATION

APPLICANT(S) FOR DO/EO/US

Bernard FERRAND, Bernard CHAMBAZ, Laurent FULBERT, and Jean MARTY

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371 (c) (2))
  - a. ☐ is transmitted herewith (required only if not transmitted by the International Bureau).
  - b. ☒ has been transmitted by the International Bureau.
  - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☒ A copy of the International Search Report (PCT/ISA/210).
8. ☐ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3))
  - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
  - b. ☐ have been transmitted by the International Bureau.
  - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
  - d. ☐ have not been made and will not be made.
9. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
10. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)).
11. ☒ A copy of the International Preliminary Examination Report (PCT/IPEA/409).
12. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)).

**Items 13 to 20 below concern document(s) or information included:**

13. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
14. ☒ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
15. ☒ A **FIRST** preliminary amendment.
16. ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
17. ☐ A substitute specification.
18. ☐ A change of power of attorney and/or address letter.
19. ☒ Certificate of Mailing by Express Mail
20. ☒ Other items or information:

Face page of International Application PCT/FR98/02848  
PCT Request form PCT/RO/101

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21. The following fees are submitted:

**BASIC NATIONAL FEE ( 37 CFR 1.492 (a) (1) - (5)) :**

- ☐ Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO ..... \$970.00
- ☒ International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO ..... \$840.00
- ☐ International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO ..... \$690.00
- ☐ International preliminary examination fee paid to USPTO (37 CFR 1.482) but all claims did not satisfy provisions of PCT Article 33(1)-(4) ..... \$670.00
- ☐ International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4) ..... \$96.00

**ENTER APPROPRIATE BASIC FEE AMOUNT =**Surcharge of \$130.00 for furnishing the oath or declaration later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492 (e)).

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE
Total claims	16 - 20 =	0	x \$18.00
Independent claims	2 - 3 =	0	x \$78.00

Multiple Dependent Claims (check if applicable). ☐**TOTAL OF ABOVE CALCULATIONS =**Reduction of 1/2 for filing by small entity, if applicable. Verified Small Entity Statement must also be filed (Note 37 CFR 1.9, 1.27, 1.28) (check if applicable). ☐**SUBTOTAL =**Processing fee of \$130.00 for furnishing the English translation later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492 (f)).**TOTAL NATIONAL FEE =**Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31) (check if applicable). ☒**TOTAL FEES ENCLOSED =**

Amount to be:	\$
refunded	
charged	

☒ A check in the amount of \$880.00 to cover the above fees is enclosed.☐ Please charge my Deposit Account No. \_\_\_\_\_ in the amount of \_\_\_\_\_ to cover the above fees.  
A duplicate copy of this sheet is enclosed.☒ The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment to Deposit Account No. 08-1391 A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

Hayes, Soloway, Hennessey, Grossman & Hage, PC  
175 Canal Street  
Manchester, New Hampshire 03101

SIGNATURE

Norman P. Soloway

NAME

24,315

REGISTRATION NUMBER

June 22, 2000

DATE

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\$40.00

\$880.00

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLN. OF: FERRAND ET AL

FILED: June 22, 2000

FOR: PASSIVE Q-SWITCHED MICROLASER WITH CONTROLLED POLARISATION

DOCKET: BREV 12923

BOX PATENT APPLICATION

The Commissioner of Patents & Trademarks  
Washington, D.C. 20231

PRELIMINARY AMENDMENT

Dear Sir:

Applicants respectfully request that you make the following amendments prior to examination.

IN THE CLAIMS:

Please cancel claims 1-16.

Please add new claims 17-32 as follows:

17. Laser cavity with controlled polarization containing a substrate made of a doped or undoped active laser material  $Y_3Al_5O_{12}$  (YAG) on which a monocrystalline layer of saturable absorbent material made of doped YAG is deposited directly by liquid phase epitaxy or by a similar process, in which the said active laser material has a [100] orientation, and the said monocrystalline layer of saturable absorbent material is deposited with the same [100] orientation.

18. Laser cavity according to claim 17, in which the said monocrystalline layer of doped saturable absorbent material is obtained by liquid phase epitaxy (LPE).

19. Cavity according to claim 17, in which the substrate is a YAG active laser material, doped by one or several doping ion(s) that confer active laser material properties on it, and for example chosen among the Nd, Cr, Er, Yb, Ho, Tm, and Ce ions.



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03101-2335 U.S.A.

603-668-1400

20. Cavity according to claim 19, in which the doping ion is neodymium (Nd).

21. Cavity according to claim 19, in which the proportion of the doping ion(s) is 0.1 to 10 moles % for each ion.

22. Laser cavity according to claim 17, in which the monocrystalline layer of a saturable absorbent material is a YAG doped with one or several doping ions chosen among Chromium (Cr), Erbium (Er), Thulium (Tm), and Holmium (Ho) ions.

23. Laser cavity according to claim 22, in which the said doping ion is Chromium.

24. Cavity according to claim 22, in which the proportion of the doping ion(s) is 1 to 10 moles % for each doping ion.

25. Cavity according to claim 17, in which the layer and/or the substrate are (also) doped with at least one (other) doping agent or substitute in order to modify their structural and/or optical properties.

26. Cavity according to claim 25, in which the said (other) doping ion is chosen among gallium and inactive rare earths.

27. Cavity according to claim 17, in which the thickness of the monocrystalline layer of saturable absorbent material is between 1 and 500  $\mu\text{m}$ .

28. Cavity according to claim 17, in which the said monocrystalline layer of saturable absorbent material is a thin layer with a thickness of between 1 and 150  $\mu\text{m}$ .

29. Cavity according to claim 17, which also comprises an entry mirror and an exit mirror, the said entry mirror being directly deposited on the substrate made of a saturable absorbent material.

30. Laser cavity according to claim 29, in which the exit mirror is directly deposited on the monocrystalline layer made of a saturable absorbent material.

31. Process for the collective production of triggered microlaser cavities with controlled polarization comprising the following steps:

- a substrate made of a doped or undoped  $Y_3Al_5O_{12}$  (YAG) active laser material with a [100] orientation is supplied in the shape of a sheet with parallel faces polished on its two faces;
- a monocrystalline layer of doped YAG saturable absorbent material is deposited on one of the faces of the said  $Y_3Al_5O_{12}$  (YAG) active laser material, by liquid phase epitaxy or by a similar process;
- the saturable absorbent monocrystalline layer thus deposited is polished;
- the entry and exit mirrors are deposited on the two polished faces of the cavity;
- the substrate - monocrystalline layer - mirrors complex thus obtained is cut out.

32. Triggered laser with controlled polarization comprising a cavity like the cavity according to claim 17, and pumping means for this cavity.

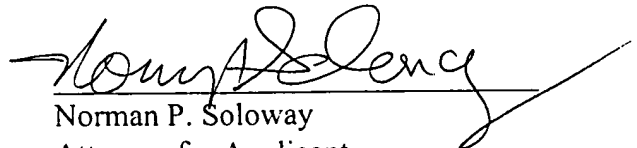




### REMARKS

The claims have been amended to better defines Applicants' invention. Examination of the application, as amended, is respectfully requested. The Applicants request that the filing fee be calculated based on the claims as amended. Examination of the application, as amended, is respectfully requested.

Respectfully submitted,

  
Norman P. Soloway  
Attorney for Applicant  
Reg. No. 24,315

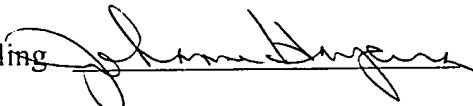
### CERTIFICATE OF EXPRESS MAILING

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Date of Deposit June 22, 2000

I hereby certify that this paper and the papers listed thereon are being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above, and is addressed to the Commissioner of Patents, US Patent and Trademark Office, Incoming Mailroom, 1B01 Crystal Plaza 2, 2021 Jefferson Davis Highway, Arlington, VA 22202-3602.

Signature of person mailing



Name of person mailing

Johanne Hrycuna

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